Relativistic Heavy Ion Collider
Magnet Division Procedure

Proc. No.: RHIC-MAG-R-7244

Issue Date: May 22, 1989

Rev. No.: A

Rev. Date: May 29, 1992

Class: Electrical Testing
Title: RHIC Megger High Voltage Insulation Test

- Cognizant Engineer: Signature on File
  BNL Magnet Division

- Approved by: Signature on File
  Head, Electrical Systems Section,
  BNL Magnet Division

REVISION RECORD

Rev. No.	Date	Page	Subject	Approval
A	5/29/92		Initial Release	

1. Scope:

This test provides a check of the insulation integrity between various components in a magnet by measuring megohm resistances with applied voltages up to 1000 volts. Thus, it is a high voltage ohmmeter test usually referred to as a "Megger test". Prior to making a Megger test, check that the electrical resistance between components being tested has a minimum value of 20 megohms. This check is included as a separate test in each of the process procedures and is described in document RHIC-MAG-R-7243. This procedure describes in detail the megger test as done at BNL. Vendors may suggest use of alternate equipment. However, vendor selected test methods shall be submitted to BNL for written approval prior to use.

2. Applicable Documents:

Data Sheet - RHIC Megger High Voltage Insulation Test

RHIC-MAG-R-7243 - RHIC Low Precision Resistance Insulation Test

Manufacturers instruction or operation manual.

3. Requirements:

High voltage megohmmeter: AEMC model 1000 or equivalent (designated below as the "Megger").

3.1 Safety Precaution:

IMPORTANT - When testing, a man should be stationed at any point where the item under test is accessible to unauthorized people, and barriers should be set up. Signs should be posted that read "DANGER HIGH VOLTAGE". At lease two men must be in the test area when testing.

3.2 Procedure:

3.2.1 Connect a safety ground cable from the magnet yoke/shell/collar and beam tube to a good electrical ground, making sure the connection is secure at both ends. It is essential that this connection be made. At no time should the "Megger" be operated without this safety ground connection.

3.2.2 Before connecting the instrument, make sure that the equipment under test has been discharged and all other test leads are disconnected.

3.2.2.1 BEFORE CONNECTING OR DISCONNECTING THE MEGGER, CHECK TO MAKE SURE THAT THE PUSH-TO-MEASURE BUTTON IS IN THE OFF POSITION. When in this condition, the instrument acts as a voltmeter and gives the operator the opportunity to make sure that the circuit under test is not powered, to rapidly discharge the capacitance of the circuit under test, and to check that the discharge has occurred. (The voltage should be zero.)

3.2.3 Preliminary Check:

3.2.3.1 Without the leads attached to the instrument, proceed as follows: For gigohm and megohm ranges: Place the push-to-measure button in the ON position. The pointer should deflect completely to the far right of the scale. The green neon "Bat. lamp" should be lit.

3.2.4 Insulation Measurements:

3.2.4.1 With the instrument in the OFF position, select the desired test voltage and range with the rotary selector switch.

3.2.4.2 Connect the resistance to be measured between the Earth (+) and Line (-) terminals. At this point, the pointer should not deflect.

3.2.4.3 Push the push-to-measure button to the ON position for tests of short duration or the LOCK-IN position for tests of long duration. THE GREEN NEON BAT. LAMP SHOULD BE LIT, INDICATING THE PRESENCE OF THE TEST VOLTAGE.

3.2.4.4 Read directly the insulation resistance on the corresponding scale.

3.2.5 Utilization of the Guard Lead:

3.2.5.1 When making a megger measurement to ground, connect the "+ Earth" lead to the grounded yoke (shell or collar) and do not use the "- Guard" lead. The component being tested is connected to the "- Line" test lead. When making a megger measurement between ungrounded components, connect the "- Guard" lead to the grounded yoke (shell or collar). The "+ Earth" and "- Line" leads are connected to the components being tested.

3.2.5.2 Disconnect all Megger test leads from the test item.

4. Quality Assurance Provisions:

The Quality Assurance Provisions of this procedure require compliance with the procedural instructions contained herein.

5. Preparation for Delivery:

N/A

DATA SHEET

RHIC Megger High Voltage Insulation Test

Magnet No. _____.

Coil No. _____.

Measured Resistance _____ Ω.

Comments: _____ Above work done by:

_____ _____

Name & Life No., Date

_____

List of Equipment Used for Measurements

Nomenclature	Manufacturer	Model	Serial No.	BNL Bar Code
Remarks:				